

THE AMERICAN JOURNAL OF PHARMACY.

MARCH, 1877.

COLORED GLASSWARE.

BY HANS M. WILDER.

Amber.—Mr. Rother ("Pharmacist," February, p. 43) furnishes a good illustration of the usefulness of amber-colored bottles in protecting the contents against the action of the chemical rays. Of a batch of tincture of kino, a portion was put in a brown bottle, and was found to be still in a good condition while the contents of the shelf bottle were entirely gelatinized. Since most preparations are sensitive to light (especially tinctures, essential oils, some of the powdered drugs and a few chemicals), amber-colored bottles should, by right, constitute the bulk of shelf-furniture. Sir John Herschel's observation, that the vegetable colors are destroyed by rays of the complementary color, will form no objection, since the complementary color of yellow is purple, and few articles possess that color.

Blue would be the right color for bottles containing "externals" or "poisons" (f. inst. aqua ammoniæ, acid. oxalic.)

White for all the remainder.

For the use of customers (prescriptions and counter sale): *Amber* only for solutions of nitrate of silver (as mentioned by Prof. Maisch, in the February number, not necessary in itself, but to serve as a distinction from other colorless preparations); *Blue*, for "externals;" *White*, for the remainder. But what have we to use for poisons?

The usual "knobbed" blue bottle is good enough, but we cannot prevent people from using the cleaned empty poison bottles for other purposes (f. inst. castor oil, sweet nitre, laudanum, etc.), and as for exchanging such bottles for white ones (that is, unobjectionable ones) every practical druggist knows that it is generally well-nigh impossible to induce people to submit to. Some invention is wanted which can be applied to bottles containing poisons, so as to serve as a distinguishing

and attention-calling mark, but which can be removed when said bottles have to serve for other purposes.

Mr. Bakes' suggestion of sand-bordered labels is a step in the right direction, but we want something more durable than pasted paper.

TINCTURE OF CATECHU.

BY LOUIS GENOIS.

Some difficulty being experienced almost daily by pharmacists in preparing the above tincture so that it will not gelatinize, the appended modification of the official formula is hereby offered :

Take of Catechu free from dirt, etc., and in small pieces,	3 troyounces ;
Cinnamon, in moderately coarse powder,	2 troyounces ;
Water,	
Alcohol, of each,	sufficient quantity.

Digest the catechu in 1 pint of water at a temperature of about 100° F., until reduced to a thin cream-like consistence ; let cool, add a pint of alcohol, let stand for twelve hours, filter ; then, with the filtrate, percolate the cinnamon, previously mixed with an equal bulk of clean sand, and moderately packed in a conical glass percolator, and when the menstruum has just disappeared from the surface, pour on sufficient diluted alcohol to make the product measure two pints. Prepared in this way, tincture of catechu is very clear, of a rich dark color, and will not deposit insoluble matter nor gelatinize inside of a year at least.

New Orleans, January 18th, 1877.

GLYCERITE OF NITRATE OF BISMUTH.

BY W. W. MOORHEAD.

(Read at the Meeting of the Alumni Association, Feb. 1, 1877.)

Glycerol of nitrate of bismuth, which was the subject of an article in the January number of the "American Journal of Pharmacy," written by B. Squire, M. B., struck me as something which druggists, as well as physicians, have long wanted, and which is destined to become one of our most valuable and prominent preparations. I prepared a portion of the glycerite, using two troyounces of nitrate of bismuth, and a sufficient quantity of glycerin to make eight fluidounces.



I would suggest to the Committee on Revision of the "U. S. Pharmacopœia," that it would be much more convenient for physicians and druggists to have all the glycerites, with the exception of the glycerite of tar, made of this definite strength, instead of the present plan of ordering two troyounces of the base and one-half pint of glycerin, making a solution of which no one can know the exact strength without experimenting to see how much increase of bulk takes place.

If the strength I have mentioned be adopted, we would have a preparation, containing in any number of minims, one-fourth as many grains of the base, and it would be a very convenient solution to use in dispensing small quantities.

Nitrate of bismuth dissolves readily in the proportion of glycerin mentioned, and the resulting glycerite can be diluted with a small quantity of water (an equal bulk or less), and yet retain all the bismuth in permanent solution.

If more than three parts of water be added to one part of the glycerite, a portion of the bismuth will be slowly deposited. The length of time elapsing before the precipitation commences, varying according to the amount of dilution. A few experiments were made to ascertain how different degrees of dilution would affect it.

One part of glycerite added to twelve parts of distilled water (by measure) commenced to precipitate in about two hours; one part in eight parts of water in four hours; one part in six parts of water in twenty hours; but in very dilute solutions it would stand much longer, as one part to forty-eight parts of water stood two days before showing any signs of precipitation.

On account of this fact of precipitating when added to water, the physician should always prescribe the glycerite of bismuth, and direct the patient to dilute it when using it.¹

ON SOLUTION OF CITRATE OF MAGNESIUM.

BY JOHN W. WATTS.

The formula for preparing solution of citrate of magnesium, as laid down in the "U. S. Pharmacopœia," is liable to a series of objections, in regard to preparation and preservation; the latter objection I do not think can be overcome by the present formula without seriously alter-

¹Compare also notes on the same preparation, on page 89 of February number.
—EDITOR.

ing its composition ; the objections to the former are twofold, first as to the length of time consumed in dissolving the magnesia in the solution of citric acid with the water, and secondly the necessity of filtering it after it is dissolved. These two objections may be admirably overcome by simply substituting boiling water in place of the cold, as prescribed, making the formula read thus :

Take of Citric acid,	450 grains ;
Calcined magnesia,	120 "
Bicarbonate of potassium,	40 "
Syrup of citric acid,	2 fl. oz. ;
Boiling water,	4 "

Dissolve the citric acid in the boiling water in a suitable vessel, and while hot add the magnesia, constantly stirring until dissolved ; decant the clear liquid from any gritty sediment that may remain ; then add the syrup and a sufficient quantity of cold water to fill a 12oz. bottle, lastly add the bicarbonate of potassium, and cork.

It is very important that the acid should be dissolved before adding the magnesia, for if the two be added together, and then the boiling water, it will form a tough gummy mass, which will be very difficult to dissolve, if at all. By this method it will not take longer than three or four minutes at the outside to prepare one or more bottles as required, whilst the officinal formula will require at least twenty minutes to complete one bottle. This saving of time is decidedly an advantage to those pharmacists who desire to dispense an article that is always fresh and pleasant to the taste ; it can very readily be prepared with but little inconvenience while the customer is waiting at the counter, and I am sure that nine persons out of every ten would prefer waiting a few moments than be compelled to swallow an almost rotten preparation that has been kept any length of time.

Baltimore, January, 1877.

SUBSTITUTE FOR SOLUTION OF CITRATE OF MAGNESIUM.

POST HOSPITAL, FORT A. LINCOLN, D. T., }
January 16th, 1877. }

To the Editor of "American Journal of Pharmacy."

The following formula is, I think, an excellent substitute for solution of citrate of magnesium, U. S. P. :

Take of Acidum citricum (in moderate sized crystals),	. 3i
Magnesii sulphas,	. 3ss—i
Syrupus simplex,	. f3iii
Extractum limonis,	. ℥v
Potassii bicarb. (in crystals),	. gr.xl
Aqua pura, sufficient for	. f3xii

M. secundum artem.

The above formula is much cheaper, and contains in a greater degree the required properties of a good, mild laxative than does the officinal solution of magnesium citrate, and also has a very pleasant flavor, the bitter taste of magnesia being entirely absent.

It is also a very expeditious and convenient manner of preparing such a solution, and will, I trust, meet the approbation of those who have not the time to while away in preparing that (to drug clerks) tedious formula, sol. magn. cit.

The following is my method of preparing it: Place acid and sal Epsom in 12-oz. bottle, then add simple syrup and water and extract of lemon—lastly, add potassium bicarb., and cork ready for use. By using the acid and potassium bicarb. in crystals the danger of gas escaping is obviated, as gas does not begin to generate before the cork can be firmly secured.

JOSEPH RHINEHART,

Hospital Steward U. S. A.

COSMOLIN CREAM.

Editor American Journal of Pharmacy:

An excellent substitute for cold cream may be obtained by the following formula:

Take of Cosmolin,	. 3xxiv
White wax,	. 3xii
Spermaceti,	. aa 3xii
Glycerin,	. f3iii
Oil of rose geranium,	. f3i

Melt the wax and spermaceti, add the cosmolin; then stir until nearly cold; add the glycerin and oil, and continue to stir until cold.

E. J. DAVIDSON, PH.G.

THE KEEPING AND DISPENSING OF EXTRACTS.

BY J. C. WHARTON.

Among the disagreeable things connected with pharmacy, scarcely any give more annoyance than solid extracts, and it is with a view of lessening the unpleasant features of this large class of our preparations that I offer the following suggestions. I cannot claim that the method herewith presented will be always practicable, but from sufficient experience can confidently recommend it as worth a trial. Before stating the proposition, however, I would prefer to give a passing notice of some of the defects in the manufacturers' part in putting up their extracts for general sale.

A very common fault is in the *consistency*. Solid extracts when first opened are not often too hard unless old, but quite frequently they are entirely too soft. Some, indeed, with a little more dilution would make passably good fluid extracts. To such an extent is this true that oftentimes a newly purchased lot of extracts will be received in such condition externally that the label is defaced and almost if not altogether illegible from the running out of the extract at the imperfectly covered top of the jar. To obviate this difficulty some manufacturers resort to a plan which dispensers, I am sure, would pronounce very objectionable in more than one respect, should their opinion be asked about it. The plan alluded to is that of placing *tin-foil* over the tops of the jars, between the cover and the extract. If the tin-foil were pure tin, one objection to this plan could not be urged; but as it usually contains a considerable proportion of lead, it must be objectionable on that account, if not dangerous to use for the purpose. However, even if harmless, it is a source of inconvenience and also loss to the dispenser, as it often gets so badly mixed with the contents of the jar as to be not easily removed, and if removed at all, occasions loss from adhering extract. Some manufacturers place a circular piece of bladder, or some sort of animal tissue, over the extracts, with much better judgment, it seems to me.

But to briefly state the point had in mind at the outset: I have found that a number of solid extracts can be kept in very good condition, and more conveniently for dispensing than in any other way I know of or have yet heard of, by simply making pills of certain sizes, $\frac{1}{2}$ grains, 1, 2, 3, 5, 10, 20 grains, or any suitable weights, accurately

made, and keeping them in the usual white earthen jar, covered with an abundance of *lycopodium*.

The convenience of this method will be appreciated when once tried. Its advantages are: its readiness for dispensing; its neatness for handling and the cleanliness of the jar and label externally; its economy, compared with the usual mode of weighing small quantities as wanted, and thereby losing what sticks to the spatulas; its uniformity of strength (not being affected by subsequent drying or deliquescence, as usual); the full weight is given, whereas by the usual method of weighing on paper some is lost, not being removable.

To this last I would add a suggestion: instead of weighing solid extracts on paper, a better plan is to dust *lycopodium* over it on taking it from the jar, and to roll it between the fingers, dusted over with the same powder. The little ball may then be weighed, as any other solid, in the dish of the scale without sticking to it. The *lycopodium* would not add materially to the weight, as it may all be blown off except a very thin film. Should perfect accuracy be demanded, both pans of the scale may be dusted over with *lycopodium* and balanced with it; then the extract may be placed in the pan, on the powder, and weighed.

The main disadvantage that appears to present itself in the matter of keeping the weighed masses is the possibility of the extract becoming so dry as to be worked up in prescriptions with difficulty. This might be prevented by a proper addition of glycerin; and I am of opinion that, even should the extract become dry, it might be softened by placing a moistened sponge in the jar with the pills, in such a manner as not to wet them, but supply a moist atmosphere, and let the pills absorb moisture without altering their shape. I have not had occasion, however, to try this plan, and cannot speak positively about its successful application.

In conclusion, it may be stated yet that the pills may be put into different jars, or several sizes may be kept in the same jar, by making partitions, or by making such great difference in the sizes or shapes of the masses as to identify them.

Nashville, Tenn., Jan. 31, 1877.

A WORD IN DEFENCE OF SUGAR-COATED PILLS.

BY J. B. MOORE.

The practice of sugar-coating pills has been for some time the subject of severe, and I think, unjust criticism, and it is with the view of trying to correct some of the errors which have gained currency among medical men by what has been said and written, that I have prepared this paper.

Having been constantly selling and dispensing sugar-coated pills and granules since the practice has to any extent been adopted, I claim that I am somewhat qualified by experience and close observation to judge of the advantages and disadvantages of the practice as it affects their therapeutic qualities. In all my experience in selling and dispensing, I might say many hundred pounds of sugar-coated pills, I have never heard of a single instance of complaint of their inefficiency or even tardiness of action, either from physicians or customers, which could, by any stretch of the imagination, be attributed to their saccharine investment.

The objections which have been urged against the practice of sugar-coating pills rest, I think, upon insufficient grounds, and cannot prevail with any force when the subject is properly considered in the light of practical experience. No arbitrary rule for general application can be made to govern the matter as to what pills should or should not be coated in extemporaneous dispensing. This must be left to the judgment of the physician or pharmacist, which judgment must be based upon the knowledge of the chemical nature, etc., of the ingredients composing the pills, and the circumstances under which they are to be employed. But I do contend that as a rule *almost all* pills which are to be kept more than a day or two, should be coated with something, sugar preferred when practicable, and more especially such as contain iodide of iron, or any of the ferrous salts of iron, asafoetida, etc., or any volatile or readily oxidizable substance. Very many substances are liable to change and to deteriorate by even a brief exposure to the variable hygroscopic conditions and other atmospheric influences, from which the coating *shields* them, and at the same time preserves the pill mass from that indefinite exsiccation and hardening which exposure would produce.

I think that all of the officinal pills, as well as the numerous popular pills, which the pharmacist is obliged to keep ready-made, such for

instance, as the comp. cathartic, comp. rhubarb, Hooper's and Lady Webster pill, and pills of iodide and proto-carbonate of iron, quinia, etc., should, by all means, be coated.

The opponents of coated pills may say "let every pharmacist make these pills in small quantities, and renew his stock every week or ten days." But, I would ask, what is to become of the old stock that remains on hand at each period of renewal, and which may be the bulk, and, in some instances, the entire lot; must these be discarded and cast away, and a new lot prepared, to be treated in like manner? Yet this must be done if we wish to meet the views of some of the opponents of coated pills, or else the pharmacists must make their pills up freshly when called for, which, I can assure my brethren, would entail upon the already complicated and onerous duties of the pharmacist an amount of labor, trouble and real annoyance, which to be appreciated must be experienced. I have realized a foretaste of this by being called upon, on several occasions, to prepare single doses of comp. cathartic, Lady Webster and various other kinds of pills, by persons whose newly-formed and unfounded prejudices against sugar-coated pills made them obstinately refuse to take them.

If the practice of sugar coating pills should be abandoned, I can assure both the medical profession and the public that they will have to use pills in a worse and more uncertain condition than they now have them in the sugar-coated form. And, unless my conceptions of human nature are very erroneous, the pill business would soon degenerate into a state of chaos and uncertainty, and the public would be served up with such a sorry set of pharmaceutical products in the shape of pills as to make them soon cry aloud for a return to the elegant and palatable sugar-coated pill, which has, for fifteen years, steadily grown into such unbounded popularity, not only with the medical profession but also with the entire public. How could they ever have attained this universal popularity if they had been insoluble, and, if insoluble, why was it not discovered long ago by medical men, who have been daily and almost even hourly prescribing them for years.

The use of glycerin in pill excipients is a very good thing as far as it goes, but it does not protect the pill from deterioration by exposure, nor does it shield the palate from the disagreeable contact of the "bitter pill." Furthermore, its hygroscopic character might, in some instances, render it positively objectionable, and in *no* case can it supply

the place of good sugar coating in preservative qualities. It is, however, an excellent excipient to employ in making pills, when eligible, either plain or coated, and I understand that the majority of our wholesale manufacturers of sugar-coated pills use it.

The argument that some pharmacists use against sugar-coated pills is that the wholesale manufacturer shares with us a portion of our profits. This weak argument may carry weight with some who have no business to occupy their time, but pharmacists who enjoy a fair run of business can spend their time much more profitably in other departments than they can in freshly making single doses of all the various popular pills for five cents each, which is the maximum price that three out of five pharmacists could get, and I have no doubt that many would be compelled to prepare them for 3 cents per dose. If any pharmacist would charge ten cents for a dose of comp. cathartic pills, his unemployed and, perhaps, ignorant neighbor would charge three or five cents, and thus either take his customer or compel him to "come down." For people are influenced very much now-a-days by the charm of cheapness, and especially in little matters of this kind.

The most popular pills, in my experience, are the officinal compound cathartic pills. These are in constant demand, and are most generally sold by the single dose, and, to accommodate customers, I keep them always put up in doses of three, four and five pills each, of which I sell many doses every day, and for the last fifteen years have sold none in this way but what have been sugar-coated, and presume that out of every fifty doses sold forty-five are in doses of only three pills each, it being very rarely that doses of four or five pills are called for, and I can scarcely recall to mind a single complaint of their inefficacy. This I consider a good test of the merits of sugar-coated pills. If the coating interfered with their solubility or activity I would most certainly have heard frequent complaints, for the public are not generally very mealy-mouthed or at all backward in telling the pharmacist of his short-comings, or of the lack of efficacy of any of his medicines. I also sell large quantities of sugar-coated Lady Webster's, compound rhubarb, phodophyllin pills, etc., and I never hear complaints of their inactivity. It is pills of this character, which produce decided and sensible effects upon the system, that are the best test with reference to their solubility.

If purgative pills will dissolve, which are liable to be hurried through

the alimentary canal by the increased peristaltic action produced by the smallest portion of the medical ingredient coming in contact with the mucous membrane of the bowels, how much more likely would the anodyne, alterative and other class of pills be to dissolve, which are liable to linger longer in their passage.

As a proof of the fallacy of the idea that sugar-coating diminishes or destroys the activity of pills, watch the steady and unwavering popularity of many of the proprietary pills, which are now, I believe, nearly all sugar-coated, such, for instance, as Wright's, Jayne's, Ayer's, Schenck's, Brandreth's, etc. Do you suppose for a moment, that if the coating of these pills interfered in the least with their activity, the proprietors would not soon discover the fact and at once abandon the practice. These men are shrewd and keep a steady eye upon their own interests, and offer to the great public their remedies in the most palatable and inviting forms. And if regular medical practitioners should insist upon dosing the public with uncoated, bitter pills, what would be the result? People who have hitherto been in the habit of using the various officinal and semi-officinal pills would buy and use in their stead some of the popular proprietary pills. This would be the natural sequence of the present crusade against sugar-coated pills, if successful.

Instead of abandoning the practice of sugar-coating pills I would rather encourage its more extensive adoption, and would recommend, if it could be conveniently done, the coating of all pills with something to conceal their taste and to protect them from atmospheric influence. If some facile and expeditious means could be devised by which the process of sugar-coating could be executed quickly, I would like to see it applied even to pills on the extemporaneous prescriptions of physicians, and thus shield the sensitive and delicate palate of the sick from the disagreeable taste and, sometimes, repulsive odor of nauseous medicines. I might, however, offer as exceptions to this rule all pills that are to be administered in diarrhœas, dysentery, cholera morbus, cholic, etc., where immediate or the promptest action is required, and where a highly exalted state of peristaltic action exists. In such cases it is probable that a freshly-made uncoated pill might be preferable.

To many persons a pill is the most acceptable form in which medicine can be administered, while to others pill-taking is a very

unpleasant task, and the idea of swallowing a pill is associated with the most unpleasant sensations, amounting, in some cases, to the utmost disgust; I have known many persons who positively could not swallow a pill. Some people always have to hold a pill in their mouths for some time, and it is only swallowed after the most strenuous efforts. This very repugnance and disgust, experienced by many persons, in taking pills and difficulty in swallowing them, has been, in many instances, I have no doubt, engendered by their being compelled to take bitter and nauseous uncoated pills, whereas had they been sugar-coated, they might never have experienced the slightest difficulty in taking pills at any time.

If regular physicians wish to render their practice unpopular with the public and encourage and foster homœopathy, let them sanction and join in the recent opposition to sugar-coated pills, and continue to discourage the employment of other elegant and palatable forms of remedies which an enlightened pharmacy offers them.

I consider opposition to sugar-coated pills an unfortunate retrograde step, and as unjustifiable and unnecessary as it is injudicious and damaging to the interests of both medicine and pharmacy. I think it should be the aim of every pharmacist, who feels a just pride in his profession, to encourage rather than discourage the adoption and perpetuation of any practice that gives elegance to his products and that renders his preparations as agreeable to the taste and as inviting in appearance as possible. The very appearance of a medicine may invite, or it may repel and excite feelings of disgust in the mind of a patient. Physicians should feel it their duty, as it most certainly is of paramount importance to their interests, to aid and encourage pharmacists in their efforts in this direction, by using and recommending such improved forms of remedies. I refer, of course, to legitimate and substantial improvements. I don't expect a physician to adopt and prescribe every new-fangled thing to which the pharmacist may call his attention, either personally, by circular or by sample, the real merit of which may be all in the label, the true composition being kept a profound secret and only known to the pharmacist himself, and the whole thing, perhaps, only a fraud and deception.

The more elegant in appearance and the more palatable medicines are the more popular the regular practice will become. It has unquestionably been, in a great measure, the disagreeable and repulsive doses of

the regular practitioner, and the palatableness of homœopathic remedies that has given the latter practice such a foothold, and rendered it so popular among the most cultivated and refined classes of our population. It is not among the ignorant and poor that homœopathic practice has attained its greatest popularity, but it is with the more cultivated and refined, whose delicate and fastidious palates revolt at nauseous doses of regular medicine. It is this class of people who will employ that doctor who will give them pleasant remedies, even though they may not really have so much confidence in his skill, in preference to one who deals out to them nauseous draughts. To ascertain the truth of what I have said, inquire of those who employ homœopathic physicians, and I will guarantee that three out of every five persons will tell you that they were allured to the latter by their pleasant remedies. Mothers will tell you that their medicines are so nice for their children; that their little darlings take their medicines so easily. There is no coaxing and petting necessary; no throwing of their little pets upon their backs and holding their noses while they pour the nauseous doses down their little throats, and then witnessing their sobs and heart-rending cries, since they have employed the homœopathic doctor.

The physician who studies to please the palate of his patient, especially if it be a woman or child, does a wise thing, in that he fortifies himself in their confidence and respect to that degree that it would require some powerfully adverse circumstance to destroy. Many, many times have I heard ladies say, oh! I do like Dr. So and So so much, he always prescribes such pleasant medicines. Hence, I say to the medical profession, pause and reflect awhile before you fall into the fatal error of taking the backward step of opposing and discouraging the use of sugar-coated pills, which give so great a finish and so much elegance to this form of remedy.

The theory of insolubility of sugar-coated pills is, at first sight, a very plausible one, and therefore apt to be accepted by medical men as true, without their having taken the time and trouble to test its verity. And especially are such theories likely to gain credence and rapid currency when they emanate from prominent writers, or are heralded by any of the "Sir Oracles" of a profession. But generally such false notions sustain but an ephemeral existence; they may for a while, like the "will-o'-the-wisp," lead the unwary astray, but they cannot long withstand the sunlight of truth and scientific practical investigation, and,

"Like bubbles on the sea of matter borne,
They rise, they break, and to that sea return."

When a remedy or form of remedy is placed under the ban of suspicion, as sugar-coated pills have been, since the senseless tirade against them was started, it is apt to be blamed unjustly, and failure of therapeutic activity ascribed to it, which *may be due* to the deranged condition of the system. The usual dose of the officinal compound cathartic pill may, in the same individual, at one time produce excessive action, while at another time it may be wholly inoperative. So with quinia and other tonics; they may at one time act with great precision, certainty and with magic power, while at another time, may be continued for weeks without any appreciable effect. This capriciousness and uncertainty of the action of medicines is a problem very difficult of solution. This lack of activity, or uncertainty in the action of a medicine may depend on some abnormal condition of the fluids and secretions of the stomach and intestinal canal; hyperæmia or vascular fullness of the mucous coat may retard or effectually prevent absorption, although the medicinal substance may be dissolved or digested, and in the most favorable condition for assimilation. Both the gastric and intestinal secretions are very much influenced also by the variable condition of the nervous system, even absorption or endosmotic action may, in a measure, be suspended or entirely suppressed by certain nervous conditions. This is evidenced by the almost entire suspension of digestion produced in sensitive persons by the sudden announcement of bad news or any powerfully depressing circumstance. Grief or great trouble of any kind in persons of a nervous and sensitive organization, may often produce an awful sense of weight and oppression in the gastric region after food, accompanied by depression of spirits, etc. Every nervous and dyspeptic person has, I have no doubt, experienced the truth of this.

Idiosyncracies of individuals, which may be unknown to the physician, may also dwarf the power of medicines and interfere with their physiological action and pervert their therapeutic effects. Opium, belladonna and other narcotic and anodyne remedies, when given to relieve neuralgic and other painful affections and to produce sleep, often produce effects diametrically opposite to what are expected of them. Calomel and other preparations of mercury, iodide of potassium, arsenic, the various preparations of iron, etc., are all conspicuous examples of a large

class of medicines which often fail in exerting their normal therapeutic effects, which, if administered in the pill form, may be unwittingly and unjustly ascribed either to their age or to their coating. These, with many other circumstances well known to medical men, may interfere with digestion, absorption and assimilation, and conspire to render the action of medicines uncertain. Hence, to test the relative merit or activity of the various kinds of pills, it is absolutely necessary in order for the therapist to arrive at a just and rational conclusion, that he should take into careful consideration all the various disturbing causes which beset the action of remedies.

In consequence of the doubt and uncertainty created in the minds of physicians and pharmacists regarding the solubility of coated pills, several pharmacists instituted a series of experiments by means of artificial digestion, to test the relative solubility of the various coated and other ready-made pills of the day. With the results of their experiments the readers of this journal, I presume, are aware. But the utmost all such experiments can demonstrate is the relative solubility of the pills under treatment in the artificial mixture in which they are digested or macerated. They cannot convey any definite or even proximate idea of the relative solubility of the pills when they are submitted to the natural process of digestion as it is conducted in the human stomach and intestinal canal. The conditions under which the artificial digestion is conducted are all so entirely different from those attending the natural process as to render comparison of results *entirely out of the question*. There is absence of the genial warmth and the muscular movements of the stomach and intestinal canal, and of the disintegrating influence of the constant agitation, trituration and the attrition to which the pill is subjected in contact with the particles of food, etc., usually present in the alimentary canal, and the powerfully solvent action of the various secretions not only of the stomach, but those of the entire mucous surface of the intestinal canal, all of which are so destructive to the integrity of the pill mass. These, we might say, are all wanting in the artificial process, and will ever render the latter, no matter how carefully conducted, nugatory and barren of even an approximation to positive or satisfactory results.¹

¹ Dr. Dalton, in his "Treatise on Human Physiology," page 133, says, concerning the muscular movements of the stomach, that this "continuous movement of the stomach is one which cannot be successfully imitated in experiments on artificial

The most valuable and most satisfactory experiments ever made to test the digestive power of the gastric juice, both in and out of the stomach, were those made by Dr. Beaumont upon his subject St. Martin, in whom there existed, as the result of a gun-shot wound, an opening leading directly into the stomach, three inches from the cardiac orifice. From this opening, gastric juice could be obtained and the process of digestion inspected, which afforded Dr. Beaumont unusual opportunities for experimenting. In order to show the fallacy of comparing artificial digestion with the natural process, I shall here quote from one of the experiments of Dr. Beaumont as I find it recorded in "*Carpenter's Principles of Human Physiology*," page 424.

A portion of meat was submitted by Dr. Beaumont to artificial digestion, under the most favorable circumstances, with gastric juice taken from the stomach of St. Martin, which required from 11½ o'clock A. M. to 9 o'clock P.M. for complete digestion, while another portion, exactly similar, was placed *in the stomach* of St. Martin at the *same time*, was, at *one o'clock P.M.*, found "to be all completely digested and gone."

Thus, it appears that meat, when submitted to artificial digestion, even with natural gastric juice in its nascent state, taken directly from the living human subject, required eight hours (six times) longer for complete digestion than it did when submitted to the crucial test of the natural process, which demonstrates how fallacious and unreliable must ever be all experiments made by artificial digestion with artificial gastric juice.¹

In many, if not in the majority of cases in which medicines are administered in the pill form, I believe there are actual physiological advantages derived from the slow and gradual solubility of the pill mass in the stomach and intestinal canal. This not only protects the often sensitive mucous membrane of the stomach from the shock which the digestion with gastric juice in test-tubes, and consequently the process under these circumstances is never so rapid or so complete as when it takes place in the interior of the stomach."

¹ Dr. Carpenter, in commenting upon these experiments of Dr. Beaumont, page 424 ("*Carpenter's Principles of Human Physiology*"), remarks that this tardy action of artificial digestion "is readily accounted for, when we remember that no ordinary agitation can produce the same effects with the curious movements of the stomach, and that the continual removal from its cavity of the matter which has been already dissolved must aid the operation of the solvent on the remainder."

sudden contact of the full force of the medicine might produce, but also allows absorption to take place gradually and more thoroughly than when the pills are freshly made and liable to be completely dissolved in a few minutes. Cathartics, particularly, are extremely liable in nervous and sensitive persons to irritate and sicken the stomach, consequently medicines of this class are often given, and are borne without discomfort, which, if administered in mixture or liquid form, would cause great distress and perhaps be ejected. The same is true of bi-chloride of mercury, iodide of potassium and many other substances which might be named that are of an irritant character. The truth of this is exemplified in the almost every-day experience of the physician and pharmacist. For the reasons here stated, physicians are not unfrequently in the habit of prescribing "old opium pills" in preference to those freshly made (see "Pil. Opii," U. S. D.); and if this be true in the case of opium, why should it not also be true in regard to many other medicinal substances. I believe that the fears entertained by some concerning the inefficiency and untrustworthiness of pills that are not freshly made to be more imaginary than real. I do not believe that there is any disadvantage in pills being old and hard if properly made, whether coated or plain, provided they have been properly preserved, and do not contain any ingredients liable to change or spoil by time and exposure. They may, perhaps, not dissolve quite so quickly as newly-made pills, but will dissolve more gradually and in due time, and be as complete and as thorough in effect and less liable to perturb the system. I have sold uncoated cathartic pills of different kinds, which I have kept on hand for years, and never found them less efficient than when they were freshly made. Slow and gradual solution throughout the digestive organs favors absorption by presenting successively fresh portions of the medicinal ingredients to the mucous membrane, and thus permitting them to be absorbed, particle by particle, through the whole course of the alimentary canal without irritating or fatiguing the organs; especially is this true of all tonic and alterative pills.

It is surprising what increased power remedies sometimes acquire when presented in small but successive fresh portions at a time to the mucous surface of the stomach and intestines. It is this frequent repetition of minute doses which gives homœopathy its success when it derives any at all from medication. We often see ipecac and other

emetics and nauseants, as well as purgatives, produce excessive action when given in minute doses and repeated every hour or so, whereas five times the dose might be given at once without, perhaps, producing any sensible effect.¹

It would seem that many pharmacists labor under the erroneous impression that digestion is conducted alone in the stomach, but this is a great mistake.²

Gastric digestion is only the first stage or commencement of the process. After a pill has been subjected to the solvent action and digestive power of the fluids of the stomach and the rough handling it receives from the muscular movements of that organ,³ if it is not dissolved, it then passes to the duodenum, where it meets with the secretions of the pancreas and liver and those of the villous coat of the intestinal canal, which, together with the gastric and salivary fluids which have passed the pylorus from the stomach intermingled with the chyme, forms a combination of greater digestive and solvent power than that of the stomach itself.⁴

¹ Dr. Dunglison, in his "Therapeutics and Materia Medica," vol. 1, page 168, well elucidates this fact by a case which he says the late Dr. James Gregory, of Edinburgh, was in the habit of relating in his lectures: "A boy was directed to take an ounce of Epsom salt, but having a strong objection to the taste of the cathartic, resolved to form it into pills with crumb of bread. On making the pills of an appropriate size, he found they amounted to three hundred and sixty, a number so near to that of the days of the year that he determined to make it correspond entirely. Accordingly he divided them into three hundred and sixty-five portions, and took them all, one after the other. The effect was extraordinary. The most violent hypercatharsis was induced, so as to endanger his life. This was owing, probably, to the gradual and successive breaking down of the pills in the canal, so that particle after particle came in contact with the mucous membrane."

² Dr. Reese, in his "Analysis of Physiology," page 172, says: "A more complete digestion, in fact, takes place in the upper portion of the intestines than in the stomach itself."

³ Dr. Reese, *loc. cit.*, page 167, says: "When the food has reached the stomach it is subjected to a peculiar peristaltic movement. This is produced by the contraction and relaxation of the various fasciculi of the muscular coat; it causes a complete revolution of the contents, in every direction, and a consequent thorough trituration."

⁴ "The fluid of the small intestines, which is compounded by the intermixture of the biliary and pancreatic secretions with the salivary and gastric fluids, and with the secretions of the intestinal glandulæ, appears to possess the very peculiar power of dissolving or of reducing to an absorbable condition alimentary substances of every class, thus possessing more of the character of a 'universal solvent' than either of

From the duodenum it passes on through the remainder of the small intestines, and through this long and turbulent route of about twenty-five feet of intestinal tube it is subjected to the warmth and solvent action of the secretions and fluids of the canal and the attrition and peristaltic movement of the bowels, which promotes rapid solution and disintegration.¹

From the small intestine the pill passes into the large intestines, and even here it is confronted with fluids destructive to its entirety; for it is the opinion of some physiologists (see "Kirk's and Paget's Physiology," page 199) that the cæcum also secretes an acid fluid similar to the gastric juice, capable of digesting substances which have eluded or resisted the action of the stomach and passed unchanged through the small intestines. If digestion and absorption did not take place to some extent in the lower portion of the intestinal canal, what would become of the excremental matter that would accumulate in the lower bowels of persons who suffer from obstinate and protracted constipation, who are sometimes for weeks or even months at a time without a passage, yet who diurnally take their usual quantity of food. The average quantity of excrementitious matter daily ejected by an adult is estimated by physiologists at from four to six ounces. There must certainly be some provision made by nature in the lower portion of the intestines for the solution, or reduction to an absorbable condition of the large amount of solid matter which would accumulate in protracted cases of torpid bowels. Of course, as is well known, about three-fourths of this matter is of an aqueous character, which may be gradually absorbed by long contact with the mucous coat of the bowels; but there must still remain, in some cases, a large bulk of solid and

these secretions has in its separate state." ("Carpenter's Principles of Human Physiology," page 432.)

In reference to the digestive power of the fluids of the intestinal canal, Dr Dalton (*loc. cit.*, page 145) says: "Although the separate actions of these digestive fluids, however, commence at different parts of the alimentary canal, they afterward go on simultaneously in the small intestines; and the changes which take place here, and which constitute the process of intestinal digestion, form at the same time one of the most complicated and one of the most important parts of the whole digestive function."

¹"The process of digestion and conversion are probably continued during the entire transit of the alimentary matter along the small intestine, and at the same time the products of that conversion are gradually being withdrawn by absorbent action." (Carpenter, *loc. cit.*, page 433.)

extremely indigestible matter, which must undergo a thorough transformation before it can be taken up by the absorbents, and which, if it should remain would produce great discomfort or even endanger life. This labor must be performed either by the fluids which pass down intermingled with the solid matter, or else by the secretions of that portion of the intestines themselves.

But even should this not be the case and such a fluid not be present, the pill, while sojourning here and in the remaining portion of the bowels, will nevertheless be subjected to the softening and solvent action of the warmth and moisture of the parts, and the disintegrating effects of peristaltic action, while at the same time absorption will take place, even from this remote region, and the medicinal ingredients will exert their therapeutic effects in a measure, if not to their full extent, because whenever a medicinal substance comes in contact with a mucous membrane or an absorbing surface, under favorable conditions, it will be taken up and exert its medicinal effects. This is illustrated by the effect of medicines and alimentary substances when administered per rectum, or when medicinal substances are administered per vagina, or when applied to a denuded surface or injected into the veins or under the skin, or when absorbed from the mucous membrane of the air passages.

Thus we see that a pill finds no quiescent state or haven of rest from the moment it enters the cardiac orifice until it passes the exit gate of the rectum; and it would seem to me that a pill, whether coated or uncoated, new or old, would have to be insoluble, indeed, to be able to stand the thorough trituration that it receives in the stomach and then to pass unchanged through the entire intestinal canal, a distance of about thirty-five feet. Therefore I would say that a pill that could run the gauntlet of such an ordeal deserves to escape. And what though a refractory pill should occasionally be found capable of such a feat, and "live to purge another day," this would not warrant us in unqualifiedly denouncing the practice of sugar-coating pills, a practice which confers such a blessing upon the invalid. Because we discern a spot upon the sun's disc, that is no reason why we should at once extinguish that glorious luminary.

Since the hue and cry against sugar coated pills has been started I have heard a great many outlandish stories told concerning them by medical men. A friend of mine in one of our wholesale drug houses

informed me some time ago of a physician in Chester county, Pa., who told him that he had in his possession a half-pint bottle filled with sugar-coated pills, which he had garnered, that had passed through the alimentary canals of his patients unchanged. Another physician, residing in this city, informed a friend of mine that he had found handfuls of sugar-coated pills that had passed from his patients unscathed. Now, I don't like to question the veracity of these gentlemen, but I am constrained to say that I don't believe these stories.

"Lest men suspect your tale untrue,
Keep probability in view."

I think that I would be safe in offering five dollars apiece for all the sugar coated pills made by any of our reputable manufacturers that can be obtained and presented *under oath* as having passed the alimentary canal undissolved under ordinary conditions of that organ. I doubt very much if enough could be collected within a year in the United States to fill a half-ounce bottle. I really think that these over-zealous relic-hunters have mistaken cherry-stones for sugar-coated pills.

When the mucous coat of the stomach and bowels are in such an excited and irritable condition as is sometimes the case in diarrhœa, dysentery, cholera morbus, etc., peristaltic action may be so excessive as to hasten the passage of substances to such a gait that time might not be given for solution or perfect digestion to take place. Under such circumstances *it might be possible* for a pill, whether coated or uncoated, new or old, to pass through the alimentary canal undissolved. Under such conditions, even portions of food may pass whole or unchanged, which under ordinary circumstances would be very digestible. But these are exceptionable cases, and even in such cases, I believe particles of *very digestible* food would be more likely to pass undigested than would medicinal substances, because such remedies as would be administered in such cases would be likely to, temporarily at least, control and restrain inordinate peristaltic action, so as to allow a pill to be dissolved when portions of food might pass unchanged.

I have, in another part of this paper, said that in the case of pills that were to be administered in diarrhœa, etc., or that were desired to act promptly, there might be some advantage in their being freshly made and uncoated, but I question very much whether there is actually any advantage accruing therefrom even in such cases. Observation and experience in the use of this form of medication would seem

to indicate that this was *not* the case. During the whole course of my early experience in pharmacy, I had occasion to make large quantities of a pill composed of opium, camphor and capsicum. This pill with many physicians was extremely popular. It was considered almost a specific in diarrhœa, dysentery, cholera morbus, and during the prevalence of epidemic cholera it was used by a great number of physicians of my acquaintance with the greatest success, in fact it was their sheet-anchor of treatment. These pills we used to make up in quantities of thousands at a time. This was almost before sugar-coating was thought of, or at least before it was introduced to any extent.

The excipient employed in making these pills was gum arabic and water, the most insoluble excipient that could be employed, and these pills were often kept on hand for months before they were used, yet no complaint was ever heard of their tardiness of action or inefficiency. One physician of my acquaintance, the late Dr. Wm. S. Latta, of near Parksburg, Pa., employed these pills very extensively in his practice. I used to prepare them for him in lots of from five hundred to a thousand at a time, which, under ordinary circumstances, would last him for a year or longer. Yet he never found these pills to lose their virtues by the petrifying hand of time, although they were used in diseases in which the alimentary canal is in the most sensitive and irritable state, and in the most unfavorable condition for solution, absorption and assimilation. This is not only my experience in the pill trade, but I have no doubt it has been the experience of thousands of other pharmacists who have had a long and large experience, and who have been observing.

This is the best kind of evidence of the power of the stomach and intestinal canal to dissolve pills that have been long kept and that are *uncoated*, while it speaks in thunder-tones in favor of pills that are *coated*; because if pills are found to be soluble and active that have been kept for years uncoated, how much more soluble would they be when carefully made and properly sugar-coated. Besides, whoever heard of frequent complaints, by physicians or any one else, of the insolubility or inefficiency of pills, either coated or uncoated, until this terrible "bug-a-boo" of insolubility of sugar-coated pills put in an appearance, notwithstanding millions of boxes of the various proprietary pills have been sold for years and years, and thousands of pounds of officinal and semi-officinal pills, saying nothing about the mongrel

varieties dispensed over the counters of pharmacists and from the offices of physicians all over the country. Many of these pills, both proprietary and those of regular pharmacy, had been kept on hand for years until, I might say, they have almost grown grey with age before they were used, yet were found to have retained their pristine and youthful activity and energy, and no sepulchral voice was ever heard, or if at all, very rarely against their efficiency.

It is by the practical experience and close observation in the sale and use of medicines of this kind that this question or problem of solubility or insolubility can be settled, and it is only upon this kind of testimony that any man, either physician or pharmacist, can base an intelligent judgment, and not upon hypothesis or the idle speculations of theorists, whose opinions are often like "airy nothings."

Even the coating of pills with silver and gold leaf, which was at one time so much in vogue, has been found by experience not to interfere with their solubility. Prof. Parrish, in his "Pharmacy," page 802, 1864, remarks, "Since the issue of the former edition of this work, the ancient practice of coating pills with silver and gold leaf has been revived." Same volume, page 803, he also says, "The former belief that a coating with metallic leaf, if sufficient to hide the taste and smell of the pills, would interfere with their solubility, has been very much modified by recent experience."

We want for testing the relative solubility of sugar-coated pills or of any other kind of pills in the alimentary canal, not test-tubes, tumblers or other utensils and artificial gastric juice, but what we want for this important purpose are living human alimentary canals. The pill which may be most soluble in artificial mixtures might be the last to return to its elementary condition in the gastric and intestinal fluids.

This question is strictly within the domain of the careful and intelligent therapist and the experienced and close observer of the action of medicines upon the human organism; and the hospital, dispensary and the private practice of the physician are fields pregnant with opportunities for experiment.

The action of the various secretions of the alimentary canal, and the influences that are at work in that living crucible, are in a great measure shrouded in doubt, and in the present state of science inscrutable to man. We can only imperfectly judge of their action by certain phenomena and results.

Besides, the materials of which pills are usually composed, will much more quickly dissolve or liquify in the fluids of the alimentary canal than will ordinary alimentary substances. In the former there is not that obstinate cohesion to overcome in order to reduce to an absorbable condition, that would be presented by the muscular fibre and vegetable tissue and other tough and insoluble parts of alimentary substances. Almost any pill-coating or pill-mass will dissolve and readily disintegrate by simple maceration for a few hours in water at the temperature of 100° , with occasional agitation, whereas you might soak a piece of beef steak or cabbage for some time before you would reduce it to a state of fluidity.

There is still another very important circumstance in the history of the digestive process, which seems to have been overlooked, or its importance not properly estimated in the consideration of this subject, and that is the length of time a pill, under ordinary circumstances, would be likely to be subjected to the solvent and digestive powers of the fluids of the alimentary canal in its passage. It is estimated by physiologists that alimentary substances average from one to two days in their transit along the intestinal tube, and from two to five hours or longer are spent in the stomach. This slow passage and long maceration in the corroding juices of the canal must insure, beyond peradventure, the thorough solution of any pill-coating or pill-mass, unless of adamantine hardness. If hyperæsthesia of the intestinal tube or other morbid condition should exist which may accelerate peristaltic movement, of course a more rapid transit would be likely to take place. But again, there are frequently inactive and comparatively stagnant conditions of the intestinal canal, in which a pill may loiter for days or even longer.

The great length of the intestinal tube, which is about six times the length of the entire body, with its numerous convolutions and varied secretions, is wisely provided by nature to adapt it to the work of a thorough digestion and absorption of indigestible alimentary matters, etc.

Upon inquiry I find that the materials most generally employed by sugar-coated pill manufacturers for making their coating, is sugar and starch, only a few add a trace of gum Arabic. It must therefore be evident to every intelligent pharmacist or other persons having a knowledge of the solvent power of aqueous fluids, when maintained at the temperature of 100° , over any mass composed of such materials,

that even the simple maceration of a pill in the juices of the intestinal canal, for from 24 to 48 hours, under the influence of the constant agitation of peristaltic action, leaving out of the question gastric digestion, would be sufficient to dissolve any pill-coating made of the above materials, even if the intestinal fluids possessed no greater solvent power than simple water.

Since the opposition to sugar-coated pills started, several manufacturers of gelatin-coated and "compressed" pills have loomed into prominence. The chief virtue upon which these manufacturers base their superiority over sugar-coated pills, and ask for them a preference, is their asserted greater solubility, and it is this assumed merit alone which, with judicious advertising, has secured them a passport to a certain amount of favor among physicians.

Now, I am for progress always, and the profession will find me an ever zealous advocate of any change in the form of any remedy that will augment its therapeutic virtues or render its administration more easy, and which carries with it real improvement; but to introduce a change or multiply forms simply for the sake of novelty, or to gratify whims or caprice, which will at the same time complicate the business of the pharmacist and lead to confusion, such innovations I shall ever oppose to the extent of my feeble influence.

The "compressed" and "gelatin-coated" pills, in my opinion, are simply novelties, and very expensive ones at that, especially the former. I have never heard complaints urged against the oval shape of the gelatin-coated pills, which, however, I deem objectionable, as rendering them difficult to swallow, but I have heard customers complain of the flat form of the compressed pills, rendering them more difficult to swallow than that of the round sugar-coated pills. Where there is one person that could more readily swallow a flat or oval body, there are fifty who would prefer to swallow a round one.

As the compressed or gelatin-coated pills possess no real therapeutic superiority, nor any advantages in point of ease of administration over the ordinary sugar-coated pills, I consider their introduction seriously objectionable. Such innovations only tend to entail greater trouble and annoyance upon both the physician and pharmacist, complicate the business of the latter and lead to confusion with the former, without conferring compensatory advantages upon either. To keep a full stock of all the varieties of compressed and coated pills would involve an

amount of capital almost equal to that required to furnish the ordinary stock of a small retail drug store.

If physicians and pharmacists continue to give their sanction and encouragement to the popularization of every new-fangled novelty, in the shape of anybody's coated pills, there is no telling where this thing will end. They will be likely to increase and multiply *ad infinitum*, until the coated pill business will soon become as great a nuisance and as troublesome to pharmacists, if not more so, than the "Elixir" business was, which some members of our profession complained so bitterly of.

If these pills were prescribed by the generic titles of "compressed" or "gelatin-coated," without the name of any particular manufacturer being specified, then the trouble and annoyance to the pharmacist would not be so great. Many of our wholesale manufacturers of pharmaceutical products have recently engaged in the manufacture of both compressed and gelatin-coated pills, and as many more, I have no doubt, will soon enter these "fresh fields and pastures new," and if the thing takes, there is no telling how many more will get at it. And all, of course, anxious to introduce their particular make of pills, will flood the entire domain of both physic and pharmacy with circulars to induce physicians to prescribe and pharmacists to buy their products. So, as I have said, if we are to keep a full assortment of everybody's make of compressed and gelatin-coated pills, in addition to our regular and staple sugar-coated stock, what are we to do? It will soon be necessary for us to not only increase our capital stock, but also to enlarge our places of business to afford increased accommodations for their storage.

I have, in common, no doubt, with many others of my brethren, already experienced a foretaste of the inconvenience and trouble that the advent of these new varieties of pills are likely to cause. Every once in a while we receive a prescription for somebody's compressed or gelatin-coated pills, which perhaps are for some impecunious individual who possibly has hardly the means to buy bread, and we are compelled to send out to some remote pharmacist, whose peculiar location gives him sufficient demand for these sporadic pharmacals to warrant him keeping a stock of them on hand. We there procure these pills, and pay so high a price for them that we are obliged, in the majority of cases, to charge almost the same price for them without any compensation for our trouble and annoyance. For if we were to

charge a reasonable profit, our customer would accuse us of extortion while the physician would come in for his share of censure for prescribing such high-priced remedies. Thus, the price alone I consider a very serious objection to these pills.

The gelatin-coated pills, although somewhat higher priced than the sugar-coated, yet are much more reasonable than the compressed. As an illustration of this, I will here quote the net list prices of a manufacturer, whose compressed pills have attained prominence and are very generally prescribed by physicians in this city, comparing them with the net prices of sugar-coated pills of our leading manufacturers.

	Compressed.	Sugar-coated.
Compound cathartic pills, per hundred, . . .	\$1.12	25 to 30 cents.
Sulphate of quinia, 1 grain, " . . .	1.57	70 to 95 "
Lady Webster's pills, " . . .	1.12	25 "
Compound rhubarb, " . . .	1.12	38 "

Thus it will be seen that the prices of compressed will average about four times the price of the same kind of sugar coated pills of our best manufacturers. And what is this enhanced price all for, which every man, woman and child will have to pay, when these pills are prescribed? It is simply, in my opinion, for the shape of the pill, which I consider not so good or desirable as that of the sugar-coated pill.

These prices I regard as excessive, considering the cost of the material, labor and time in manufacturing. Now, if there was any earthly advantage therapeutically in these pills over the sugar-coated ones, there would then be something to justify the physician in prescribing them; but it will require some stronger evidence to convince me of their superiority than the mere asseveration of their patentees or manufacturers. We want, in my opinion, no better pill than the sugar-coated, when it is properly made. Sugar-coating, when well done, is the very *acme* of elegance of all forms of coating.

So far as the sugar-coating of pills is concerned, I believe that all of our more reputable manufacturers vie with each other in the beauty, elegance and perfection of their coating, and also pay due regard to the solubility. This they would do for the sake of their own reputations and for the popularity of their products. There are, I have no doubt, some who might not be over-conscientious about substituting cinchonina for quinia or podophyllin for extract of jalap, in the pill mass, and who would not deign to spoil the coating for the sake of

saving a few cents. This would be too like "spoiling the ship for a shilling's worth of tar."

I have no fear myself of the solubility of pills in the alimentary canal, whether they be coated with sugar or gelatin or compressed. What I would dread more than anything else in ready-made pills would be the deception and fraud which might be practised by dishonest manufacturers in the selection and proportionment of the ingredients. Although, I must confess, that I have much faith in the probity and conscientiousness of most manufacturers, and believe the sugar-coated pills of our leading houses to be about as reliable as any other class of pharmaceuticals which we buy ready-made, and which we have no means of ascertaining the quality of by convenient and reliable tests. We, of course, with sugar-coated pills, as with extracts, fluid extracts, powders, etc., have to rely upon the honesty of the manufacturers for their purity and proper proportions of the materials used in their fabrication, and the care and skill employed in their production.

The only plan that can be adopted by the pharmacist to avert the danger of the deception to which he is liable by the faulty composition of ready-made pills, is for him to make in his own laboratory all his own pills, and then send them to some skillful and reliable person and have them coated to his own order, if he has not the facilities for doing so. By this means he can always feel assured of the quality of his pills, and can recommend them to his customers and to physicians with confidence. This, in fact, every pharmacist should do, not only with sugar-coated pills, but with every pharmaceutical preparation he sells that he is capable of making properly.

Unfortunately, however, too many pharmacists, like the retail clothier, buy their goods ready-made—a practice too reprehensible to need comment. Of course there are some preparations for which the demand is too limited to warrant the pharmacist in making; the time, trouble and waste of material in the preparation of so small a quantity would often deter him, and very justly too, from the task. But all pharmaceuticals, for which there is a reasonable demand, should be made by the pharmacist himself.

Before quitting this subject, it may not be improper for me to address a word or offer a few suggestions to the manufacturers of sugar-coated pills, although what I may offer may not be new to many.

In coating pills of asafoetida, iodide and protocarbonate of iron, or

those containing camphor, myrrh, phosphorus or any of the volatile oils, or in fact, any volatile or readily oxidizable substance, the greatest care should be exercised to avoid exposure to too high a temperature. The desiccation should, I think, be conducted in a dry atmosphere, at the ordinary temperature. This would involve a longer exposure, but it would entail less risk of partial decomposition or volatilization of the active ingredients. And in all pills containing such or similar substances, would it not be well to first give them a coat of tolu before that of sugar is applied? Would not such a plan aid very greatly in preserving such pills from change or loss of activity when long kept? With the fear of that awful "bug-bear" of insolubility before their eyes, sugar-coated pill manufacturers often commit the error of coating their pills before they are properly dried. In consequence of this, the moisture often soaks through the coating, the pills become discolored, often taste of the ingredients and are unfit for sale. All pills should of course be dried with care, preparatory to coating, but unless they contain any volatile or oxidizable substances, rapid drying to the proper condition for coating can do them no possible injury.

The object of this paper is to show the injustice and to demonstrate the utter fallacy of the tirade against sugar-coated pills.

In order to convince my readers of the sincerity of what I have said, and to attest my faith in the powers of the *human* alimentary canal to dissolve any properly made sugar-coated pill, I make the following offer: I will present to any chemist, physician or pharmacist in the United States, as a reward of merit, the sum of *twenty-five dollars*, who will manufacture a pill-coating from the same kind of materials, and in the same proportions, and by the same process usually adopted by our best manufacturers of sugar-coated pills, which will render a sixth, quarter and half grain morphia pill, or the officinal compound cathartic pill, insoluble and inoperative, and fail of producing their characteristic therapeutic effects when properly administered, under any physiological conditions of the system or alimentary canal in which these same kinds of pills *will* display their usual medicinal effects when *freshly* made and uncoated.

I wish it to be understood that in writing this paper I have "no friends to reward nor enemies to punish"; I merely write in the interests of science, my profession and for the welfare of the sick. In writing

upon such an important subject, I feel it incumbent upon me, as it should be upon any one, to speak the truth and give expression to my honest convictions, "hew to the line, let the chips fly where they will."

I have given this subject much thought and careful consideration, and have treated it in this minute and thorough, and, I hope, impartial manner which its importance demands; and should I have, inadvertently, made any erroneous statement, I shall be most happy to have any physician or pharmacist who may be more enlightened upon the subject than myself, to correct me.

Philadelphia, Pa., February, 1877.

A READY TEST FOR ARSENICAL COMPOUNDS.

BY EDWARD GAILLARD, PH.G.

Read at the Pharmaceutical Meeting, February 20th.

Who is the pharmacist that has not been called upon by his patrons or the physician to know, at once, if this powder or that liquid did not contain ratsbane or arsenic, and often been obliged to make some excuse for the lack of knowledge, or felt the want of a more simple and ready test for the detection of arsenic, than the old, time-honored one of Marsh's. If we have the apparatus, or extemporize one, are we positive that it is free, at all time, of traces of that metal from previous operations; besides it labors under many serious disadvantages. First, that sulphuric acid; secondly, that metallic zinc, which are employed in the test, may, one or other of them, or even both, contain more or less of arsenic as an impurity, and thus the indications of that substance obtained may be due not to its existing in the suspected matter under investigation. I may add that it is difficult to get, in commerce, zinc and sulphuric acid perfectly free from arsenic.

The test proposed by Edmund W. Davy, professor of forensic medicine in the Royal College of Surgeons, of Ireland, is one of such simplicity, and has proved so practical in my hands that I would recommend it to the pharmacist desiring be to *Probus Paratus*, always ready, at the instant, to decide at once when life and death depend upon his knowledge, and is so easy of execution that it may be performed by almost any one, and found practical for the object stated, especially to those who are not conversant with the details of chemical manipula-

tion. It is a modification of Marsh's test, a well known method, and is founded on the circumstance that nascent hydrogen, in the presence of certain compounds of arsenic, will give rise to the formation of arseniuretted hydrogen; and thus very minute quantities of arsenic, under different circumstances, can be readily detected.

The modification used is the employment of an amalgam of sodium and mercury as a means of generating the hydrogen required for the test, and by the use of this substance do away with, altogether, the necessity of any acid, and employ two metals which are not liable to arsenical contamination. As to sodium, arsenic has never been pointed out as one of its impurities, and as to its presence in mercury, that is a circumstance of very rare occurrence; should it exist in that metal as an impurity, it can be readily removed from it by digesting the mercury in dilute nitric acid, and afterwards well washing it with water.

The amalgam found to answer best for the test consists of one part, by weight, of sodium to eight or ten parts of mercury, and is easily made by heating, moderately, in a test-tube, over a lamp, the mercury, and then adding gradually, in small pieces, the sodium, taking care to keep the mouth of the tube away from the face, if unprotected, lest some of that metal, in an ignited state, might be spurted out during the additions of the first portions.

The metals combine readily under these circumstances, forming an alloy that is liquid whilst hot, but becomes hard and brittle when cold. The contents of the tube, while still hot and liquid, are quickly poured out on a clean plate, when cool broken up for future use, and immediately placed in a stoppered bottle. The way to employ this amalgam is simply to place the suspected matter, or solution, along with a little water, in the bottom of a test glass or a tumbler; then add a small bit of amalgam, about the size of a grain of wheat; and, lastly, place, without delay, on the top of the glass a piece of white filtering paper or the cover of a white porcelain crucible, moistened with a drop of a dilute solution of nitrate of silver, slightly acidulated with nitric acid, when, if arsenic is present, a dull black or deep brown stain on the paper, or a dark silvery one on the porcelain, will be quickly developed in the part moistened, owing to the silver of the salt being reduced to a metallic condition by the arseniuretted hydrogen thus evolved.

The silver solution, found to answer well for this purpose, is made

by dissolving 20 grains of nitrate in an ounce of distilled water, adding 2 drops of nitric acid, to render the solution slightly acid. Exceedingly minute quantities of arsenic can be readily detected by this very simple process. Thus one-one thousandth part of a grain of arsenious acid dissolved in 1 cc. of distilled water gives a very decided effect in a few moments, and even a smaller quantity can be detected; as, for example, one drop of Fowler's solution in an ounce of water will indicate in a little time by the blackening of the silver salt. I may further state that the presence of organic matter seems to interfere but little with this test; for I have found that very minute quantities of arsenious acid, when mixed with considerable amounts of milk, tea, coffee, ale or porter, or flour, could, with almost the same facility, be detected by this method, showing the applications are very extended.

Antimony is the only metal which is capable of uniting with nascent hydrogen to form a gas (antimoniuretted hydrogen), which, coming in contact with nitrate of silver, produces black antimonide of that metal; and the blackening of the silver salt from the formation of that compound might be easily mistaken for the effect produced by the arsenical gas.

The fact, first pointed out by Fleitmann, that antimoniuretted hydrogen is not evolved (except, perhaps, as a mere trace) from strongly alkaline solutions, though the conditions may exist there for its formation, and as the action of the sodium amalgam is to render the mixture quickly alkaline, there will be only a very minute quantity of the antimony that may be present so evolved; and by previously rendering the mixture strongly alkaline, we may altogether prevent the evolution of that gas.

If, however, we make the mixture containing the antimony in solution first strongly acid, and then add the amalgam, or even acidify after its addition, the antimoniuretted hydrogen will be evolved in abundance, producing a deep black stain on the paper moistened with the nitrate of silver, and, for the purpose of this acidification, tartaric acid answers very well.

As the presence of alkalies in solution does not interfere with the evolution of the arsenical gas, this itself is a means of distinguishing the two metals, arsenic and antimony.

ADULTERATIONS.

BY RICH. V. MATTISON, PH.G.

(*Read at the Pharmaceutical Meeting, Feb. 20.*)

Adulterations and sophistications are extensively practised. A large number of such articles are sold and used through the drug trade, and there is a certain demand among a large class of its members for cheap drugs, without regard to quality; the entire scrutiny being directed to the quantity delivered, and the price at which it is invoiced.

The apparently simple article of beeswax, for instance, is adulterated in every conceivable way, with almost every article at all analogous to it in physical properties. Paraffin, rosin, stearin and Japan wax, are employed, or a mixture of all these; the latest sophistication, we believe, being a mixture of rosin and paraffin, coated—electroplated as it were, with pure wax.

The fecula of arrowroot is perhaps rarely sold without admixture with other starches, and balsam of tolu and copaiba are so frequently adulterated as to need only mention in passing. The article known as Oregon Balsam of Fir has been one of peculiar interest, and the source of it was satisfactorily explained in the last number of the JOURNAL, thanks to our friend Dr. Miller, who by the way, we think rather throws the blame of adulterations upon the Western trade. The firm mentioned as soaking off the labels of the eastern manufacturers of quinia, etc., and adulterating with cinchonina hydrochlorate, salicin, etc., and who had also dies prepared and tinfoil caps made with the same design, letters and general facsimile style of the ones adopted by the Eastern manufacturers referred to, and who took the headings from barrels of borax and citric acid, partially filling the same with crushed crystals of alum and tartaric acid respectively, who also removed half the acid from the fifty pound boxes of tartaric acid, filling the same with cream of tartar which itself had been previously adulterated with calcium and potassium sulphates, and of whom a thousand more acts of a similar nature with which we are conversant might be mentioned, and who by the way are now out of business, were it is true a Western firm, but we think it due to their associates to say that when the exposé took place, they refused to have any dealings with the firm referred to, both openly and privately discountenancing the whole proceeding.

The Eastern trade is just as prone to this evil of adulteration as the Western or Southern. We have in our mind's eye a firm in our own city whom we doubt if ever shipped alcohol to their customers without the requisite quantity of water being added to furnish the desirable margin of profit. Chloroform is diluted with alcohol, spirit of nitrous ether with the same, cottonseed oil is sent out for "finest olive oil," as the article obtained from *Olea Europea* is evidently a myth in the minds of the proprietors. Concentrated glycerin is diluted with water and sold as "pure glycerin," oil of turpentine is invariably sophisticated with benzin, and flaxseed oil undergoes the same treatment. Tolu has the rosin dodge, and copaiba the castor oil device, and nothing leaves the establishment that can be tampered with without the same being done. In short, the whole history of the firm is one of sophistication, fraud and deceit; it is but a repetition of that of many others, and the disgrace to pharmacy lies not so much in the fact that the articles are adulterated as in the fact that the adulterated articles are sold openly and without question so long as they are a little cheaper than those sold by the trade regularly.

Now what is the remedy for this? It lies in a more liberal education, in the cultivation of a more liberal spirit toward the seller of drugs and other articles. Let us illustrate: a traveler visits the retailer in his regular rounds and offers, say bitartrate of potassium and calcined magnesium a few cents under the market price of these articles; the latter purchases the same and after seeing that the articles are of correct weight his responsibility ceases.

Does it cease? Unfortunately such is usually the case, but does not the fact that he has bought it under the market price of the same, rouse some suspicion as to its character? Is he not morally criminal until he satisfies himself of the purity of the article in question? Let it be understood that we do not object to anyone buying things cheaply. This in many cases is the secret of success, let everyone buy as cheaply as they can, but of course the smaller the margin of profit the greater the temptation to adulteration, and we do insist that no one has a right to purchase goods under market or at any price, for that matter, and dispense the same without examining them closely regarding quality.

Again it is very frequently the case that adulterated articles are dispensed by the retailer, with a full knowledge of this fact and without any compunctions of conscience.

The only remedy for this lies in a higher, broader more liberal education. It lies in breaking off from the humdrum every-day life of the shop, where the dispensing of senna and salts, chamomile and castor oil, manna and magnesia, and the endless routine of little things are apt to narrow one's ideas and make the need of a little relaxation through attendance at the pharmaceutical meetings, through the meetings of the Association, and through a large and liberal reading of the current pharmaceutical literature of the day an urgent necessity. Examinations by reagents, by physical characteristics, by the microscope, of all articles bought, whether from reputable parties or not, are imperative. No pharmacist should, and no thorough pharmacist will, ever place an article in his stock for dispensing without examining it; when adulterations are discovered make the fact known through the journals. Support the journals that are laboring for the advancement of the better interests of pharmacy, help them along liberally, encourage them by your subscriptions, your kind words and notes of interest. The editor of a journal needs encouragement just as much as an orator needs attention and interest to bring out his finest sentences, or an actor applause to make him forget himself and in his intense realization of his part, surpass his previous efforts. Remember, that in these days of strict economy the most lavish and reckless extravagance is to save the subscription price of a good pharmaceutical journal.

Philadelphia, February 10, 1877.

NOTE on the DETECTION of CASTOR OIL in COPAIBA.

BY JOHN M. MAISCH.

(Read at the Pharmaceutical Meeting, Feb. 20.)

At the last meeting I incidentally remarked ("Am. Jour. Pharm.," 1877, p. 84) that the test for the detection of castor oil in copaiba by petroleum benzin, as proposed by Prof. Wayne, was fallacious. The test is recommended to be applied (*Ibid.*, 1873, p. 326) by shaking the suspected balsam with three times its volume of petroleum benzin, when, if castor oil be present, a milky mixture is stated to be formed, separating quickly into two layers, the lower containing all the castor oil. Having often repeated this experiment with different copaibas mixed with their own bulk of castor oil, an absolutely transparent solution was always obtained with three or four volumes of petroleum

benzin, and the solutions remained clear and free from sediment after standing for several days and even weeks. Mr. Chas. A. Bowman, however, informed me that with larger quantities of the benzin, a separation of the castor oil from the copaiba could be effected, and that copaiba alone would yield with sufficient petroleum benzin a turbid mixture from which a flocculent precipitate would subside.

On dissolving a pure copaiba in petroleum benzin, it was found that with eight measures of the latter the solution was perfectly transparent. On the addition of another measure of benzin, a slight turbidity occurred, which increased with more benzin, but it took nearly a week before the liquid became clear again, depositing at the same time some transparent resinous matter. When the same copaiba had been previously mixed with castor oil, it required the same amount of petroleum benzin to produce a turbid solution, from which, in the course of twelve hours, an oily liquid had settled to the bottom, equal in bulk to the castor oil employed. But in the course of several days the lower layer, containing the castor oil, had increased to more than double the volume.

It appears from this that petroleum benzin may be used for the purpose indicated, if not less than *ten* volumes are employed, instead of *three*, as originally proposed by Prof. Wayne. But it must not be overlooked that pure copaiba will also produce a turbid, though less opaque solution, and its separation and the examination of the lower layer may become necessary, unless a sufficient quantity of the castor oil, to be remunerative to the sophisticator, had been added, in which case the dense milkiness will at once indicate it.

Different kinds of copaiba will be found to be of somewhat different behavior. A sample has been handled by Mr. Bowman, which, with *six* volumes of the benzin, became turbid and *readily* separated floccules, while another, as stated before, acquired its maximum turbidness with *ten* measures of benzin, and *slowly* deposited a transparent resin; another kind, a Para copaiba, over 16 years old, required fifteen measures of benzin before a slight turbidity was produced, and even after it had been mixed with its own bulk of castor oil, the amount of benzin mentioned did not disturb it to a very appreciable extent. Professor Wayne, having operated with a sample from which the castor oil was separated by *three* measures of petroleum benzin, it is evident that the variations are very considerable, and it is not impossible that still greater ones may be observed with other kinds of copaiba.

TINCTURA OPII DEODORATA.

BY THEOD. G. DAVIS.

Much has been written about opium and its preparations, particularly this, the most elegant of all, yet I trust I am not presuming in giving the following, my favorite mode of manipulating.

The proportions used are the same as in the "Pharmacopœia" process, except of alcohol, of which double the amount is used.

Boil the opium, with twelve fluidounces of water, for half an hour, and strain, with expression, through muslin; boil the residue with eight fluidounces of water for fifteen minutes and again express; repeat the same operation with four fluidounces of water; mix the expressed liquids, evaporate to four fluidounces, when nearly cold add, gradually, with agitation, eight fluidounces of alcohol (to precipitate gum, starch, pectin, etc.), filter, washing the filter with alcohol, and evaporate to four fluidounces (the alcohol may be recovered by distillation); when cool, finish by shaking with ether, etc., as directed in the "Pharmacopœia" process, which requires *four* days before a finished product is obtained, while by the proposed process *one* day is sufficient in which to obtain a preparation more elegant in appearance and more completely *deodorized* than any I have been able to prepare when following the official directions.

VARIETIES.

An Ancient Metrical System.—From the library of Sardanapalus, King of Assyria (found by Layard at Niniveh), it is proved that the Assyrians, some 3,000 years ago, had a system of weights and measures almost as philosophical and methodical as the French metrical system, all the units of surface, volume and weight being derived from a single linear unit. The base of the system was the cubit or elbow (equal to 20·67 of our inches). These cubits, multiplied with 360, gave the stadium, measure for great distances. The fundamental unit of surface was the square foot (foot equal to three-fifths of the cubit). The cubic foot constituted the metreta (bushel), which, with its sub-divisions, was the standard of all measures of capacity. A metreta of water was the talent, the unit of all measures of weight. The sixtieth part of the metrita gave the mine, and this divided into sixty parts the drachm. The weight of the metrita (or bushel, water) was about 70 avoirdupois pounds, the mine about 18·7 ounces, and the drachm about 159 grains. The sexagesimal system appears to have been used in all these calculations, and is evidently a very practical one, combining the advantages of the decimal and the duodecimal systems —H. M. W. from *Manuf. and Build.*

Yerba santa, the leaves of *Erioduction glutinosum*, have been used by Dr. Gabel, of Aurora, Ill., in several cases of bronchitis with very good results. The preparation employed was a saturated tincture made with 70 per cent. alcohol, and given in doses of 15 minims or less, combined with glycerin, three or four times a day. It is stated that the agent is a remedy in *atonic* conditions only, and that in inflammation it is worse than useless.

Cancer Remedies.—Dr. J. L. Horr, of Cumberland Mills, Me., states in the "Bost. Med. and Surg. Journ.," Oct. 5, 1876, that the late Dr. Lombard, formerly famous in that region as a "*cancer doctor*," applied the inspissated juice of *Phytolacca decandra* in the form of a plaster until sloughing took place, using afterwards a simple dressing like simple cerate. For large tumors a paste composed of chloride of zinc and powdered *sanguinaria* was employed until an eschar was produced, after which the same plaster was used.

Preservation of Syrup of Iodide of Iron.—H. F. Meier, in the "Druggists' Circular," Dec., 1876, proposes for this purpose the addition of some hydriodic acid, which he prepares by dissolving 153 grains of pure tartaric acid in 4 fluid-ounces of alcohol, adding to a solution of 166 grains of potassium iodide in 2 fluidounces of water, filtering from the precipitated potassium bitartrate and evaporating the filtrate to 2 fluidounces. Each fluid drachm contains 8 grains of anhydrous acid, and is stated to be sufficient to preserve at least 4 pounds of this syrup.

Carbolated Camphor, recommended by Dr. Soulez, in the "Bulletin de Thérap.," is made by dissolving 25 grams of camphor and 9 grams of crystallized carbolic acid in one gram of alcohol. It forms pale yellow, oily liquid, having a slight odor of camphor, miscible in all proportions with olive and almond oils, and solidifying when heated to boiling and then thrown into cold water.

Iodized phenol is recommended by Dr. Rob. Battey, of Rome, Ga., as a new uterine escharotic and alterative. It is prepared by combining with a gentle heat half an ounce of iodine with one ounce of crystallized carbolic acid. The preparation is solid in cool weather.

For some purposes, a preparation containing more carbolic acid has been found serviceable; it is made by mixing $1\frac{1}{2}$ oz. iodized phenol, 1 oz. crystallized carbolic acid and $\frac{1}{4}$ oz. water; this preparation is permanently liquid.—*Amer. Pract.*, Feb.

New Anæsthetic Agent.—Rabuteau, in a memoir read before the Académie des Sciences, states that he has investigated the physiological properties and mode of elimination of hydrobromic ether. He has satisfied himself that this anæsthetic agent, which possesses properties intermediate to those of chloroform, bromoform and ether, might be advantageously employed to produce surgical anæsthesia. The hydrobromic ether is neither a caustic nor an irritant. It can be ingested without

difficulty, and applied without danger, not only to the skin, but to the external auditory meatus and to the mucous membrane. It is eliminated completely or almost completely by the respiratory passages in whatever way it may have been introduced into the system.—*Med. and Surg. Rep.*, Feb. 24.

Phosphorus pills are prepared by Thos. Haffenden, by fusing the phosphorus under a little mucilage in a dish placed in a water-bath, then stirring to form a kind of emulsion, after which the powder to form the pills is rapidly but carefully stirred in with a small spatula, care being taken to keep the mass together, otherwise, if spread on the warm sides of the cup, the phosphorus is apt to catch. When well mixed together, they may be put in a mortar and worked up in the usual way.—*Phar. Jour. and Trans.*, 1876, Sept. 23.

E. J. Appleby has experimented with cacao butter, tolu balsam and resin as excipients for phosphorus, and finds that with the first named, the mass requires some time and patience to prepare, and must be divided into pills and coated at once. The phosphorized tolu balsam is difficult to incorporate with other ingredients, and pills made from it soon lose their shape, and are with difficulty soluble in water. Phosphorized resin on the contrary is easily prepared, and may be kept under water for any length of time. It can be quickly reduced to a fine powder, and easily made into a pill mass.—*Ibid.*, Oct. 7.

MINUTES OF THE PHARMACEUTICAL MEETING.

FEBRUARY 20th, 1877.

The meeting was organized by electing Robert England to the chair; A. W. Miller officiated as Registrar, *pro temp.*

James T. Shinn rose to explain that his remarks, as recorded in the minutes of the last meeting, were not intended to cast reflection on physicians themselves, but related only to the very great variation in the size of the conventional domestic measures for administering medicines, which must of necessity produce marked discrepancies in the division of the doses of liquids.

Prof. Maisch presented a pamphlet received from Dr. E. R. Squibb, entitled "The American Medical Association and the Pharmacopœia of the United States of America."

Prof. Maisch stated that he had recently been informed that in the Prussian army, even when in actual service in the field, the compounding of prescriptions is done only by weighing, the use of measures of capacity being almost entirely prohibited.

A. W. Miller presented a specimen of oil of cubebs, prepared by percolating the ground drug with light petroleum benzin, permitting this to evaporate spontaneously, and then subjecting the residue to distillation. The product was entirely free from all odor of petroleum. About 3 lbs. of essential oil were obtained from 25 lbs. of the drug, and about 20 ounces of resin, fatty oil, etc., were left in the still.

E. Gaillard read an interesting paper on a new and convenient method of detecting arsenic by the use of an amalgam of sodium. (See page 126.) His remarks were illustrated by the practical application of the test to liquids to which arsenious anhydrid and tartar emetic had been added. In connection with this subject, Prof. Maisch stated that solutions of nitrate of silver are not affected by light, in support of which assertion he exhibited a solution made by himself eight years ago, which was still perfectly clear. He explained that the decomposition of the argentic salt, when it does occur, is due to the presence of organic matter. James T. Shinn inquired as to whether with the frequent introduction of camel hair pencils, sponges or the like, reduction would not proceed more rapidly in the light than in the dark. Prof. Maisch replied that reduction would take place in either case, but possibly under these circumstances somewhat more tardily in the dark than in the light.

James T. Shinn presented a cake of Joseph L. Lemberger's pure beeswax, moulded in such a manner as to be readily broken into squares each weighing one ounce. E. M. Boring rose to state that he was an advocate of home manufactures; he had tried Lemberger's process of hot filtration through paper, but had not succeeded well with it; he had, however, found simple straining through muslin to furnish a satisfactory article, provided proper care was exercised in selecting the crude beeswax. James T. Shinn, on the contrary, expressed satisfaction in being relieved by one so reliable as Joseph L. Lemberger of the tedious, disagreeable and dirty labor of refining beeswax so as to fit it for use in pharmacy.

A. W. Miller presented a specimen of so-called berry wax, the product of *Myrica cordifolia*, from Cape Town, Africa. The wax is of a dull greenish color, closely resembling in its general appearance the myrtle wax of this country.

Prof. Maisch read a note on the detection of castor oil in copaiba, and illustrated the subject by several experiments. R. V. Mattison stated that he had also tried the petroleum tests for copaiba, but had become quite confused by them. Prof. Maisch said that so far aqua ammoniac was still the best test; he attributed the perplexing variation in the behavior of the copaiba to its production from different botanical sources.

In accordance with the instructions of the last pharmaceutical meeting, A. W. Miller had expressed the thanks of the College for the valuable donations made by the late Prof. Carson. He read the following communication, which he had received in reply:

JANUARY 25TH, 1877.

MY DEAR SIR—Permit me to acknowledge the receipt of your favor of yesterday, conveying the thanks of the Philadelphia College of Pharmacy for the presentation through Professor Remington. The interests of the College were always near my father's heart, and I am personally much gratified at the disposition made.

Very sincerely yours,

HAMPTON L. CARSON.

R. V. Mattison read a paper on adulterations of drugs and chemicals (page 129), making serious charges against some of the wholesale dealers. As the statement had been made that adulterations were far more common in our country than elsewhere, Prof. Maisch explained that adulterated articles were found everywhere, and not only in America; that, for instance, resin of jalap which had never seen jalap was frequently offered in Europe. He maintained that we here had, in fact, one advantage over Europe, in so far that with us everything is at once published far and wide, while

abroad the tendency is rather to keep matters of this kind secret, as a sort of public disgrace. Prof. Remington related having had submitted to him several months ago a specimen of ground gentian, purchased from a wholesale druggist of this city, which on examination proved to be almost pure saw-dust. Prof. Maisch improved the opportunity by directing the attention of the students present to the necessity of the careful study of prosenchymatous and parenchymatous tissues, which in this case would alone be quite sufficient for the recognition of the substitution. A. W. Miller stated that there was a manufacturer of ground gentian in this city who made no pretence to sending out a pure article, merely claiming that his compared favorably with that furnished by other establishments.

E. Gaillard called attention to the process of bleaching sponges, as described on page 399 of the "Am. Jour. Phar." for 1875. He had tried it with very satisfactory results, and exhibited a number of specimens bleached in this manner, and with permanganate of sodium in place of the potassium salt. He used a very dilute hydrochloric acid (one ounce to the gallon) to remove the calcareous matter, without injuring the texture of the sponge. The process possesses another advantage in altering the coloring matter permanently, while the old method, using hyposulphite of sodium and hydrochloric acid, bleaches only temporarily.

James A. Maston exhibited a piece of compressed camphor, and invited the members of the College to visit the establishment of Wm. F. Simes & Son, to witness the manufacture of this article.

Prof. Remington directed the attention of the meeting to the large assortment of specimens obtained from the commissioners of various governments at the late Exposition. He exhibited samples of cream of tartar, tartaric acid and argols; sulphur earths, Italian proprietary medicines, effervescent granular salts, fine Austrian essential oils, German anilin products in great variety, Schering's pyrogallie acid and salicylate of sodium, etc.

ADOLPH W. MILLER, Registrar *pro temp.*

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

The Philadelphia College of Pharmacy has adopted the recommendation of the Conference of Schools of Pharmacy, and introduced, near the close of the last session, an examination of first course students, of which seventy of the latter availed themselves. The participation of the students, the results attained in this instance and the opportunity thus afforded not only of finding out to what extent the students had profited from the instruction, but also of specially advising them of deficiencies, appear to be regarded so favorably by the Examining Committee and Professors, that such a *junior examination* will undoubtedly be held annually hereafter. Twelve specimens were placed on the table for recognition, and answers, in writing, to the following questions required:

1. What compound is formed by the combustion of Charcoal? Give the method by which it is usually obtained and collected for experiment or use. What are its properties, composition, effects on living animals and general names of its metallic compounds?

2. What is the Muriatic Acid of the "U. S. Pharmacopœia?" How is it prepared and what are its properties and official specific gravity?
3. What is the proper chemical name for Green Vitriol? Describe and explain a method by which it can be obtained, and give an account of its properties and the changes it undergoes when exposed to the air.
4. Describe the conditions and manner of the formation of Vegetable Cells.
5. Name the integuments of Seeds, and explain briefly the different parts of the Kernel.
6. Which drugs of animal origin consist mainly, and to what extent, of Carbonate of Calcium?
7. Define Specific Gravity, and state how you would obtain the Specific Gravity of a piece of lead weighing 200 grains.
8. State, in a few words, what the difference is between a Decoction and an Infusion, a Cerate and an Ointment, a Tincture and a Fluid Extract.
9. What Liquid official principle, soluble in water, is obtained from fats? Mention some of its uses in Pharmacy, and describe its appearance.
10. From what Country is Rhubarb obtained? Where does it grow? What Calcium Salt in large proportion does it contain? How may the presence of this Salt be known? What Organic Acids does it contain?
11. State the number of grains in an Avoirdupois pound, an Avoirdupois ounce, a Troy pound and a Troy ounce, and give the weight, in grains, of a Fluidounce of distilled water.
12. Give the formula for making Liquor Calcis. State whether hot or cold water should be employed, and the reason why. If left exposed to the atmosphere what effect will be produced? What is a test for it?

The Alumni Association of the Philadelphia College of Pharmacy held a meeting February 1st, President Kennedy in the chair, about fifty members being present. After reading of the minutes, specimens were handed to the students for examination.

Mr. Kennedy submitted a small and curiously-shaped vial, containing a few drops of Chinese oil of peppermint, which was quite thick and differed considerably from the domestic article in odor.

Mr. Jones presented handsome specimens of the iodides of lead and mercury and ferrocyanide of iron, made by a first course student of the college.

Mr. Kennedy referred to a plant found in Nicaragua, named *phytolacca electrica*, which is said to possess very pronounced electrical properties, sensibly benumbing the hand upon touching it; the magnetic influence is asserted to be felt at a distance of seven or eight feet and the intensity to vary with the hours of the day, being hardly perceptible at night, while attaining its maximum about 2 P. M.

Dr. Miller spoke of the hieroglyphic signs occasionally used in prescriptions, tracing back these symbols to their alchemical origin. Copies of these signs, with their explanation, will be furnished gladly to any applicant to A. W. Miller, M.D., Third and Callowhill streets.

Mr. Moorhead read a paper on glycerol of nitrate of bismuth (see p. 98), and submitted a specimen.

Mr. H. Lerchen reported that an examination of the solution and residue

obtained by treating a rubber nipple with nitric acid showed the presence of zinc and calcium, but no lead.

After a description of the electrical pen, as used by their firm, Dr. Miller mentioned a lot of powdered catechu, obtained from New York, which yielded very little extractive matter to either water or alcohol, and when ignited gave 50 per cent. of ash.

Maryland College of Pharmacy.—At the business meeting held in January Dr. J. B. Baxley, who has served the college long and faithfully as Treasurer and Dean, tendered his resignation as an officer of the body, which was accepted with many regrets.

The following officers were elected for the ensuing year: Jos. Roberts, President; Wm. Silver Thompson and Wm. H. Osborn, Vice Presidents; Wm. E. Thornton, Treasurer; Louis Dohme, N. H. Jennings and F. Hassencamp, Board of Examiners; Edwin Eareckson, Secretary.

At the Pharmaceutical Meeting held February 8th, the leading feature was a very animated and interesting discussion on the "U. S. Pharmacopœia," and the propriety of admitting, to at least a semi-official position in that work some of the elixirs and other new-fashioned preparations of the day. Many of the leading members advocated the measure, on the ground that a number of such preparations have become standard remedies with practitioners, and their use is likely to increase rather than diminish, hence it would be far better to have a regularly recognized formula for their preparation, so as to insure uniformity of strength, flavor and properties. The merits of the metrical system were also freely discussed, the members generally expressing their readiness to adopt the method whenever required.

The Connecticut Pharmaceutical Association held its Second Annual Meeting at New Haven, February 8th, Mr. N. Dykeman presiding. About fifty new members joined the Association; efforts were set on foot to secure protection from burdensome taxation; delegates to the National Association were appointed, and the following officers elected: N. Dikeman, of Waterbury, President; Henry Woodward, of Middletown, and A. F. Wood, of New Haven, Vice-Presidents; Alfred Daggett, of New Haven, Secretary; George P. Chandler, of Hartford, Treasurer; Executive Committee, L. I. Munson, of Waterbury, Dwight Phelps, of Winsted, E. S. Sykes, of Hartford; Committee on "Progress of Pharmacy," Samuel Noyes, of New Haven, Samuel R. McNary, of Hartford, F. S. Stevens, of Bridgeport.

EDITORIAL DEPARTMENT.

Pills.—The present number contains a long and exhaustive paper on this subject from the pen of Mr. J. B. Moore; although, according to its heading, it has been written in defence of one particular variety of this form of medication, it aims to

prove that there can scarcely be any variety of coated or uncoated pills, if made with due caution, which would not dissolve in its passage through the stomach and intestines. Experiments undertaken with a view of testing the solubility of the various kinds of pills have only, and we believe were never claimed to possess any other than a relative value, in so far as they enable us to judge, not of the *absolute*, but of the *relative* length of time in which they are likely to produce their medicinal effects. We are an advocate of home productions, and believe that pharmacists should make, as nearly as possible, *all* pharmaceutical preparations in their own store or laboratory, even though some of them may cost rather more than similar preparations as found in the market. If due attention be paid to the quality of the raw material and to the processes, it cannot but be a satisfaction to the pharmacist and a source of gratification, to feel assured of the quality and effectiveness of all preparations dispensed by him, aside from the consideration that by adopting such a course many otherwise idle minutes would be usefully filled up and occasions for practical experience afforded in which many apprentices and assistants are very deficient.

We favor, partly for the reasons stated, the uncoated pill; at the same time we do not lose sight of the fact that the taste of such pills is often repulsive to many patients, and that others are unable to swallow medicines in that form, and to them a coating which hides the odor and taste is quite a boon. Formerly such coatings were, and are still, to a limited extent, made by the pharmacist; but the improvements made in the processes and apparatus, as worked on the large scale, has very nigh put this labor altogether into the hands of the wholesale manufacturer, whereby an elegance of appearance has been attained which is unapproachable by the means at the command of the dispenser. It seems, therefore, what we need is the construction of apparatus, of limited cost, which would enable the pharmacist to furnish the pills of the same elegance as the manufacturer, and to this point should be turned the attention of our inventive pharmacists. The construction, by Prof. Remington, of an improved pill press, for the preparation of compressed pills, which was described in our last volume, was such a step, and we trust that the time may not be far distant when apparatus for coating pills with desirable materials may likewise be in the hands of the dispenser.

As to the nature of the coating, we believe that not only the inclinations of physicians but likewise the tastes of patients will ever differ, and the pharmacist should therefore be prepared to furnish, at short notice, pills elegantly coated with sugar, gelatin or licorice, the last-named material having been recently recommended for that purpose.

Regarding the heat to which pills, while being sugar-coated, are subjected, we believe that its effects have been greatly over-rated, as in the outcry against the employment of moderate heat, raised some years ago, in the preparation of fluid extracts and extracts. Of course we admit that there is a possibility of spoiling by the injudicious application of heat almost any organic material kept in the drug store; but there are points in every process which, if neglected, will tend to vitiate the results.

A Pharmacy law in Maine has been recently passed, and received the sanction of the Governor February 9th. According to its provisions the Governor has to appoint three *suitable persons* to be commissioners of pharmacy, who are to examine every applicant desiring to engage in the business of an apothecary; said applicant must have been employed in an apothecary store where physicians' prescriptions are compounded, at least three years, or must have graduated from some regularly established *medical school or college of pharmacy*, and be *competent for the business*. The act does not apply to physicians putting up their own prescriptions or to the sale of proprietary medicines.

The law seems to be wisely framed, if by the *suitable persons* mentioned above, pharmacists are understood. The power of the board to inquire into the *competency* even of graduates appears to be very judiciously conferred, since several concerns have been established, here and elsewhere, where pharmaceutical diplomas may be obtained without putting the searcher after such honors to any trouble of studying, or requiring of him any practical experience.

A Fatal Mistake occurred recently in this city, in consequence of which a young lady died after suffering great agonies. It appears that the victim sent to a drug store for a dose of castor oil, to be prepared so that it could be readily taken. The shop bottle containing hydrochloric acid was placed near the one containing mint water, and the former liquid was used for the mixture in place of the latter, the mistake not being discovered until nearly the whole contents of the tumbler had been swallowed. Although vomiting took place and antidotes were administered, the corrosive poison did its fatal work, and the druggist who made the mistake is now awaiting the action of the grand jury.

This is one of those cases the occurrence of which would have been impossible if the poisonous articles had been kept in a place entirely separate from the non-poisonous drugs and preparations, and should be a warning to those who still follow that practice. The pharmacist has to be constantly on the alert, and simple prudence alone should dictate a separation of the milder and more powerful remedies.

Bogus Degrees.—We learn from several European journals that an enterprising fellow advertises in some German papers, offering academical degrees *in absentia*, to be applied for under an address in Jersey, England. The "Chemical News" calls attention to this, and states that the degrees offered emanate from the "University of Philadelphia." We think that it should be pretty well known in Europe by this time that such an institution has no existence in this city; and if there are still dupes to be found who spend their money for a worthless piece of paper, it would be but charity and commiseration with such child-like simpletons to inform them once more of this fact, and that the frauds who are at the bottom of this rascality have not the slightest connection with the *University of Pennsylvania*, in this city.

Correction.—The statement on page 88 should read that Miss Clara Marshall fills the chair of *Materia Medica* at the Woman's Medical College, and instructs the lady students in pharmacy during the spring term.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

The Microscopist, a manual of microscopy and compendium of the microscopic sciences, micro-mineralogy, micro-chemistry, biology, histology and pathological histology. By J. H. Wythe, A.M., M.D., Professor of microscopy and biology in the Medical College of the Pacific, San Francisco. Third edition. Philadelphia: Lindsay & Blakiston, 1877. 8vo, pp. 259. 205 illustrations. Price, cloth, \$4.50.

The evident object of the work before us is not to take the place of such standard works as Beale's, but to serve as a guide to the beginner and advanced student, and as a handy work of reference and consultation even to the expert, as well as a means to indicate the direction in which investigations are to be undertaken. After a brief chapter on the history and importance of the microscope, its various forms and accessories, its use, the methods of examination and the mounting and preservation of microscopic objects, are considered and followed by dissertations upon its use in the various branches of science enumerated on the title page. Aside from the first six chapters, which contain the general instructions for the student in microscopy, the chapters on the use of the microscope in chemistry and in vegetable histology and botany are those of paramount importance to the pharmacist, and in several others he will find much that is useful to him in deciding questions that are likely to be submitted to him. Although the work was not specially written for pharmacists and druggists, yet we feel assured that they can use it with profit, and that it will aid them in entering and cultivating a field of examination and research which has hitherto been rather neglected. As a further recommendation for the work, we may state that it has been gotten up in an excellent manner, and that not only the text, but also the illustrations, are all that can be desired.

Chemical and Pharmaceutical Directory, of all the chemicals and preparations (compound drugs) now in general use in the drug trade; their names and synonyms alphabetically arranged. By John Rudolphy. Chicago, 1877: John Rudolphy. Large 8vo, pp. 407. Price \$5.00.

The work is divided into three parts: 1. English, Latin, German; 2. Latin, German, English; 3. German, Latin, English, and in its general arrangement is similar to the *Pharmaceutical Directory*, published by the same author a number of years ago. In the three parts the subjects are arranged, as far as chemicals are concerned, under the names of the bases, while the pharmaceutical preparations have been arranged in classes, such as tinctures, extracts, cerates, etc. The old nomenclature has been adopted for the chemicals, but has not been consistently carried through. Thus we find *kali bromatum*, *kali iodatum*, etc., instead of *kalium bromatum*, *kalium iodatum*, of the "German Pharmacopœia," and similar inconsistencies are noticed in the English names. Though generally correct, some errors are observed in the translations. Thus, on page 220, *natrum chloratum* and *natrum chloratum liquidum* are translated with *soda chlorate* in English, and in the German with the equivalent for *soda hydrochlorate*, while according to the nomenclature of the "German Pharmacopœia" it should be *chloride of* or *chlorinated soda*. Under *liquor natri chlorati*, the translations are correct. In some instances the

popular English names are not given, as in the case of *tinctura rhois radicanis*, which is translated tincture rhois radicans; instead tincture of poison sumach, poison vine, or poison oak.

Generally, the Latin names are those adopted by the "German Pharmacopœia," or as met with in German pharmacy. We find *chininum*, *chinidinum*, etc., but not *quinia* or *quinidia*; *kali aceticum*, *chloricum*, etc., but not *potassii acetat*, *chlorat*, etc.; and thus we find expressed the aim of the work to be a dictionary of the pharmaceutical and chemical terms as used by German physicians and pharmacists, and in this respect it is very complete. In our examination we have not found missing any of the important synonyms, even of older date, which are occasionally employed in prescriptions, or met with in medical and pharmaceutical works. The work will be found a valuable hand-book, and of great service to pharmacists, druggists and physicians.

The American Medical Association and the Pharmacopœia of the United States of America. By Edward R. Squibb, M.D. Brooklyn, 1877. 8vo, pp. 59.

The pamphlet consists of extracts from the minutes of the American Medical Association, the American Pharmaceutical Association and the Kings County Medical Society, of an account of the Proceedings of the New York College of Pharmacy, and of a proposed plan for the future management of the "U. S. Pharmacopœia," to be submitted to the American Medical Association at its annual meeting in Chicago, in June, 1877. It is especially addressed to those bodies which were represented in the national convention for revising the "Pharmacopœia," and which are represented in the American Medical and in the American Pharmaceutical Association. The plan proposes such a radical change that it is eminently desirable that the various bodies alluded to should take it into careful consideration and act officially upon the suggestions.

The Vermont Medical Register for the year 1877. Edited by Chas. P. Thayer, M.D. Burlington, 1877. 12mo, pp. 120.

Lists of physicians, dentists, druggists and dealers in drugs and nurses, also lists of the educational, medical, dental and pharmaceutical institutions in the United States and of the charitable institutions of Vermont are found in this little book, together with laws of that State, relating to various sanitary, etc., matters, and other information of interest to the physician and pharmacist. Among the pharmaceutical institutions enumerated, we find two formerly connected with medical colleges, which have been discontinued since the establishment of a College of Pharmacy in Washington; at least two in which lectures have never been delivered, and two or three which are of equivocal existence, while on the other hand the second oldest College of Pharmacy in the United States, that of New York, has been omitted.

Emmons' Annual Medical Directory of Regular Physicians in the State of Illinois, for the year 1877. Chicago: F. A. Emmons, M.D. 12mo, 109 pages.

This Register is arranged alphabetically by towns and by the names of the physicians, and contains also a list of the U. S. Pension Examining Surgeons in Illinois.

The Naturalists' Directory, containing the names of Naturalists, Chemists, Physicists and Meteorologists, arranged alphabetically, with an index arranged according to Departments. By Samuel E. Cassino. Salem, Mass., 1877. 8vo, pp. 80.

The aim and arrangement of this Directory is sufficiently explained by its title; intended to embrace the Naturalists of the United States and Canada, it will prove useful to all engaged in those pursuits.

The reception of the following pamphlets is hereby acknowledged :

Milk Analyses. By S. P. Sharples, S.B. Reprint from the Proceedings of the American Academy of Arts and Sciences.

Note on the Administration of Phosphorus. By E. R. Squibb, M.D. From the Proceedings of the American Pharmaceutical Association.

Liebig's Extract of Malt and its Chemical Composition, Manufacture and Therapeutical Uses. By F. D. Davis, M.D. From the Transactions of the American Medical Association.

Untersuchungen aus dem Pharmaceutischen Institute in Dorpat. Researches from the Pharmaceutical Institute in Dorpat. Communicated by Prof. Dragendorff. Reprinted from "Archiv der Pharmacie."

OBITUARY.

DR. JOHANN CHRISTIAN POGGENDORFF, Professor of Physics at the University of Berlin, died there January 24th. He was born at Hamburg, December 29th, 1796, and when in his sixteenth year entered a pharmacy as an apprentice and afterwards served as assistant until 1820, when he matriculated at the University of Berlin, following his favorite studies, chemistry and physics. Already in 1821 he published an important essay on the magnetism of the voltaic pile, in which he described the electro-magnetic multiplier. In 1824 he became editor of the "Annalen der Physik und Chemie," known in the scientific world as *Poggendorff's Annalen*, which he continued to edit until his demise. The celebrated *Handwörterbuch*, a chemical dictionary, was commenced in 1837, Liebig, Wöhler and Poggendorff being the editors. A history of the exact sciences, from his pen, was published in 1839, and a biographical and literary dictionary to the history of the exact sciences in 1863. The deceased was appointed professor in 1834, and in 1838 was elected a member of the Berlin Academy of Sciences. His numerous contributions to science were published in his "Annalen."

WILLIAM G. SCHMIDT died at Louisville, Ky., January 11th, after a very brief illness, aged 38 years. He had been in business there for a number of years, and was highly esteemed for his enterprise and honorable dealing, and for his public worth as a citizen. In the inception and organization of the Louisville College of Pharmacy he was a leading spirit and faithfully served that institution in various capacities, having, to the last, a deep interest in, and solicitude for, the advancement of its prosperity. He was a member of the American Pharmaceutical Association, and, at the meeting in Louisville, as a member of the local committee, labored incessantly to make the sojourn of the visitors both pleasant and profitable.